

SEQUENCE LISTING

<110> Jackson, W. James
Pace, John L.

<120> CHLAMYDIA PROTEIN, GENE SEQUENCE AND USES THEREOF

<130> 7969-076-999

<140> 09/542,520

<141> 2000-04-03

<150> PCT/US98/20737

<151> 1998-10-01

<160> 41

<170> PatentIn Ver. 2.0

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<223> Description of Artificial Sequence:
recombinant expression vector

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Leu Thr Leu Lys Asn Leu Asp Asn Ser Ile Ala Ala Leu Pro Leu Ser
65 70 75 80

Cys Phe Gly Asn Leu Leu Gly Ser Phe Thr Val Leu Gly Arg Gly His
85 90 95

Ser Leu Thr Phe Glu Asn Ile Arg Thr Ser Thr Asn Gly Ala Ala Leu
100 105 110

Ser Asp Ser Ala Asn Ser Gly Leu Phe Thr Ile Glu Gly Phe Lys Glu
115 120 125

Leu Ser Phe Ser Asn Cys Asn Pro Leu Leu Ala Val Leu Pro Ala Ala
130 135 140

Thr Thr Asn Asn Gly Ser Gln Thr Pro Ser Thr Thr Ser Thr Pro Ser
145 150 155 160

Asn Gly Thr Ile Tyr Ser Lys Thr Asp Leu Leu Leu Leu Asn Asn Glu

165										170					175				
Lys	Phe	Ser	Phe	Tyr	Ser	Asn	Ser	Val	Ser	Gly	Asp	Gly	Gly	Ala	Ile				
			180					185					190						
Asp	Ala	Lys	Ser	Leu	Thr	Val	Gln	Gly	Ile	Ser	Lys	Leu	Cys	Val	Phe				
		195					200					205							
Gln	Glu	Asn	Thr	Ala	Gln	Ala	Asp	Gly	Gly	Ala	Cys	Gln	Val	Val	Thr				
	210					215					220								
Ser	Phe	Ser	Ala	Met	Ala	Asn	Glu	Ala	Pro	Ile	Ala	Phe	Val	Ala	Asn				
225					230					235					240				
Val	Ala	Gly	Val	Arg	Gly	Gly	Gly	Ile	Ala	Ala	Val	Gln	Asp	Gly	Gln				
				245					250					255					
Gln	Gly	Val	Ser	Ser	Thr	Ser	Thr	Glu	Asp	Pro	Val	Val	Ser	Phe					
		260					265					270							
Ser	Arg	Asn	Thr	Ala	Val	Glu	Phe	Asp	Gly	Asn	Val	Ala	Arg	Val	Gly				
		275					280					285							
Gly	Gly	Ile	Tyr	Ser	Tyr	Gly	Asn	Val	Ala	Phe	Leu	Asn	Asn	Gly	Lys				
	290					295					300								
Thr	Leu	Phe	Leu	Asn	Asn	Val	Ala	Ser	Pro	Val	Tyr	Ile	Ala	Ala	Glu				
305					310					315					320				
Gln	Pro	Thr	Asn	Gly	Gln	Ala	Ser	Asn	Thr	Ser	Asp	Asn	Tyr	Gly	Asp				
			325						330					335					
Gly	Gly	Ala	Ile	Phe	Cys	Lys	Asn	Gly	Ala	Gln	Ala	Ala	Gly	Ser	Asn				
		340						345					350						
Asn	Ser	Gly	Ser	Val	Ser	Phe	Asp	Gly	Glu	Gly	Val	Val	Phe	Phe	Ser				
		355					360					365							
Ser	Asn	Val	Ala	Ala	Gly	Lys	Gly	Gly	Ala	Ile	Tyr	Ala	Lys	Lys	Leu				
	370					375					380								
Ser	Val	Ala	Asn	Cys	Gly	Pro	Val	Gln	Leu	Leu	Gly	Asn	Ile	Ala	Asn				
385					390					395					400				
Asp	Gly	Gly	Ala	Ile	Tyr	Leu	Gly	Glu	Ser	Gly	Glu	Leu	Ser	Leu	Ser				
			405					410						415					
Ala	Asp	Tyr	Gly	Asp	Met	Ile	Phe	Asp	Gly	Asn	Leu	Lys	Arg	Thr	Ala				
		420						425					430						
Lys	Glu	Asn	Ala	Ala	Asp	Val	Asn	Gly	Val	Thr	Val	Ser	Ser	Gln	Ala				
		435					440					445							
Ile	Ser	Met	Gly	Ser	Gly	Gly	Lys	Ile	Thr	Thr	Leu	Arg	Ala	Lys	Ala				
	450					455					460								
Gly	His	Gln	Ile	Leu	Phe	Asn	Asp	Pro	Ile	Glu	Met	Ala	Asn	Gly	Asn				
465					470					475					480				

Asn Gln Pro Ala Gln Ser Ser Glu Pro Leu Lys Ile Asn Asp Gly Glu
 485 490 495
 Gly Tyr Thr Gly Asp Ile Val Phe Ala Asn Gly Asn Ser Thr Leu Tyr
 500 505 510
 Gln Asn Val Thr Ile Glu Gln Gly Arg Ile Val Leu Arg Glu Lys Ala
 515 520 525
 Lys Leu Ser Val Asn Ser Leu Ser Gln Thr Gly Gly Ser Leu Tyr Met
 530 535 540
 Glu Ala Gly Ser Thr Leu Asp Phe Val Thr Pro Gln Pro Pro Gln Gln
 545 550 555 560
 Pro Pro Ala Ala Asn Gln Ser Ile Thr Leu Ser Asn Leu His Leu Ser
 565 570 575
 Leu Ser Ser Leu Leu Ala Asn Asn Ala Val Thr Asn Pro Pro Thr Asn
 580 585 590
 Pro Pro Ala Gln Asp Ser His Pro Ala Val Ile Gly Ser Thr Thr Ala
 595 600 605
 Gly Ser Val Thr Ile Ser Gly Pro Ile Phe Phe Glu Asp Leu Asp Asp
 610 615 620
 Thr Ala Tyr Asp Arg Tyr Asp Trp Leu Gly Ser Asn Gln Lys Ile Asp
 625 630 635 640
 Val Leu Lys Leu Gln Leu Gly Thr Gln Pro Pro Ala Asn Ala Pro Ser
 645 650 655
 Asp Leu Thr Leu Gly Asn Glu Met Pro Lys Tyr Gly Tyr Gln Gly Ser
 660 665 670
 Trp Lys Leu Ala Trp Asp Pro Asn Thr Ala Asn Asn Gly Pro Tyr Thr
 675 680 685
 Leu Lys Ala Thr Trp Thr Lys Thr Gly Tyr Asn Pro Gly Pro Glu Arg
 690 695 700
 Val Ala Ser Leu Val Pro Asn Ser Leu Trp Gly Ser Ile Leu Asp Ile
 705 710 715 720
 Arg Ser Ala His Ser Ala Ile Gln Ala Ser Val Asp Gly Arg Ser Tyr
 725 730 735
 Cys Arg Gly Leu Trp Val Ser Gly Val Ser Asn Phe Phe Tyr His Asp
 740 745 750
 Arg Asp Ala Leu Gly Gln Gly Tyr Arg Tyr Ile Ser Gly Gly Tyr Ser
 755 760 765
 Leu Gly Ala Asn Ser Tyr Phe Gly Ser Ser Met Phe Gly Leu Ala Phe
 770 775 780
 Thr Glu Val Phe Gly Arg Ser Lys Asp Tyr Val Val Cys Arg Ser Asn

785					790											795				800
His	His	Ala	Cys	Ile	Gly	Ser	Val	Tyr	Leu	Ser	Thr	Lys	Gln	Ala	Leu					
				805					810					815						
Cys	Gly	Ser	Tyr	Val	Phe	Gly	Asp	Ala	Phe	Ile	Arg	Ala	Ser	Tyr	Gly					
			820					825					830							
Phe	Gly	Asn	Gln	His	Met	Lys	Thr	Ser	Tyr	Thr	Phe	Ala	Glu	Glu	Ser					
		835					840					845								
Asp	Val	Cys	Trp	Asp	Asn	Asn	Cys	Leu	Val	Gly	Glu	Ile	Gly	Val	Gly					
	850					855					860									
Leu	Pro	Ile	Val	Ile	Thr	Pro	Ser	Lys	Leu	Tyr	Leu	Asn	Glu	Leu	Arg					
865					870					875					880					
Pro	Phe	Val	Gln	Ala	Glu	Phe	Ser	Tyr	Ala	Asp	His	Glu	Ser	Phe	Thr					
			885						890					895						
Glu	Glu	Gly	Asp	Gln	Ala	Arg	Ala	Phe	Arg	Ser	Gly	His	Leu	Met	Asn					
			900					905					910							
Leu	Ser	Val	Pro	Val	Gly	Val	Lys	Phe	Asp	Arg	Cys	Ser	Ser	Thr	His					
	915						920					925								
Pro	Asn	Lys	Tyr	Ser	Phe	Met	Gly	Ala	Tyr	Ile	Cys	Asp	Ala	Tyr	Arg					
	930					935					940									
Thr	Ile	Ser	Gly	Thr	Gln	Thr	Thr	Leu	Leu	Ser	His	Gln	Glu	Thr	Trp					
945					950					955					960					
Thr	Thr	Asp	Ala	Phe	His	Leu	Ala	Arg	His	Gly	Val	Ile	Val	Arg	Gly					
			965						970					975						
Ser	Met	Tyr	Ala	Ser	Leu	Thr	Ser	Asn	Ile	Glu	Val	Tyr	Gly	His	Gly					
		980						985					990							
Arg	Tyr	Glu	Tyr	Arg	Asp	Thr	Ser	Arg	Gly	Tyr	Gly	Leu	Ser	Ala	Gly					
	995						1000					1005								
Ser	Lys	Val	Arg	Phe																
	1010																			

<210> 16
 <211> 1013
 <212> PRT
 <213> Chlamydia

<400> 16
 Met Gln Thr Ser Phe His Lys Phe Phe Leu Ser Met Ile Leu Ala Tyr
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 Ser Cys Cys Ser Leu Thr Gly Gly Gly Tyr Ala Ala Glu Ile Met Val
 20 25 30
 Pro Gln Gly Ile Tyr Asp Gly Glu Thr Leu Thr Val Ser Phe Pro Tyr

35					40					45					
Thr	Val	Ile	Gly	Asp	Pro	Ser	Gly	Thr	Thr	Val	Phe	Ser	Ala	Gly	Glu
50						55					60				
Leu	Thr	Leu	Lys	Asn	Leu	Asp	Asn	Ser	Ile	Ala	Ala	Leu	Pro	Leu	Ser
65					70					75					80
Cys	Phe	Gly	Asn	Leu	Leu	Gly	Ser	Phe	Thr	Val	Leu	Gly	Arg	Gly	His
				85					90					95	
Ser	Leu	Thr	Phe	Glu	Asn	Ile	Arg	Thr	Ser	Thr	Asn	Gly	Ala	Ala	Leu
			100					105					110		
Ser	Asp	Ser	Ala	Asn	Ser	Gly	Leu	Phe	Thr	Ile	Glu	Gly	Phe	Lys	Glu
		115					120					125			
Leu	Ser	Phe	Ser	Asn	Cys	Asn	Ser	Leu	Leu	Ala	Val	Leu	Pro	Ala	Ala
	130					135					140				
Thr	Thr	Asn	Asn	Gly	Ser	Gln	Thr	Pro	Thr	Thr	Thr	Ser	Thr	Pro	Ser
145					150					155					160
Asn	Gly	Thr	Ile	Tyr	Ser	Lys	Thr	Asp	Leu	Leu	Leu	Leu	Asn	Asn	Glu
			165						170					175	
Lys	Phe	Ser	Phe	Tyr	Ser	Asn	Leu	Val	Ser	Gly	Asp	Gly	Gly	Thr	Ile
			180					185					190		
Asp	Ala	Lys	Ser	Leu	Thr	Val	Gln	Gly	Ile	Ser	Lys	Leu	Cys	Val	Phe
		195					200					205			
Gln	Glu	Asn	Thr	Ala	Gln	Ala	Asp	Gly	Gly	Ala	Cys	Gln	Val	Val	Thr
	210					215					220				
Ser	Phe	Ser	Ala	Met	Ala	Asn	Glu	Ala	Pro	Ile	Ala	Phe	Ile	Ala	Asn
225					230					235					240
Val	Ala	Gly	Val	Arg	Gly	Gly	Gly	Ile	Ala	Ala	Val	Gln	Asp	Gly	Gln
				245					250					255	
Gln	Gly	Val	Ser	Ser	Ser	Thr	Ser	Thr	Glu	Asp	Pro	Val	Val	Ser	Phe
		260						265					270		
Ser	Arg	Asn	Thr	Ala	Val	Glu	Phe	Asp	Gly	Asn	Val	Ala	Arg	Val	Gly
		275					280					285			
Gly	Gly	Ile	Tyr	Ser	Tyr	Gly	Asn	Val	Ala	Phe	Leu	Asn	Asn	Gly	Lys
	290					295					300				
Thr	Leu	Phe	Leu	Asn	Asn	Val	Ala	Ser	Pro	Val	Tyr	Ile	Ala	Ala	Glu
305					310					315					320
Gln	Pro	Thr	Asn	Gly	Gln	Ala	Ser	Asn	Thr	Ser	Asp	Asn	Tyr	Gly	Asp
				325					330					335	
Gly	Gly	Ala	Ile	Phe	Cys	Lys	Asn	Gly	Ala	Gln	Ala	Ala	Gly	Ser	Asn
			340					345					350		

Asn Ser Gly Ser Val Ser Phe Asp Gly Glu Gly Val Val Phe Phe Ser
 355 360 365
 Ser Asn Val Ala Ala Gly Lys Gly Gly Ala Ile Tyr Ala Lys Lys Leu
 370 375 380
 Ser Val Ala Asn Cys Gly Pro Val Gln Phe Leu Gly Asn Ile Ala Asn
 385 390 395 400
 Asp Gly Gly Ala Ile Tyr Leu Gly Glu Ser Gly Glu Leu Ser Leu Ser
 405 410 415
 Ala Asp Tyr Gly Asp Ile Ile Phe Asp Gly Asn Leu Lys Arg Thr Ala
 420 425 430
 Lys Glu Asn Ala Ala Asp Val Asn Gly Val Thr Val Ser Ser Gln Ala
 435 440 445
 Ile Ser Met Gly Ser Gly Gly Lys Ile Thr Thr Leu Arg Ala Lys Ala
 450 455 460
 Gly His Gln Ile Leu Phe Asn Asp Pro Ile Glu Met Ala Asn Gly Asn
 465 470 475 480
 Asn Gln Pro Ala Gln Ser Ser Glu Pro Leu Lys Ile Asn Asp Gly Glu
 485 490 495
 Gly Tyr Thr Gly Asp Ile Val Phe Ala Asn Gly Asn Ser Thr Leu Tyr
 500 505 510
 Gln Asn Val Thr Ile Glu Gln Gly Arg Ile Val Leu Arg Glu Lys Ala
 515 520 525
 Lys Leu Ser Val Asn Ser Leu Ser Gln Thr Gly Gly Ser Leu Tyr Met
 530 535 540
 Glu Ala Gly Ser Thr Leu Asp Phe Val Thr Pro Gln Pro Pro Gln Gln
 545 550 555 560
 Pro Pro Ala Ala Asn Gln Leu Ile Thr Leu Ser Asn Leu His Leu Ser
 565 570 575
 Leu Ser Ser Leu Leu Ala Asn Asn Ala Val Thr Asn Pro Pro Thr Asn
 580 585 590
 Pro Pro Ala Gln Asp Ser His Pro Ala Val Ile Gly Ser Thr Thr Ala
 595 600 605
 Gly Pro Val Thr Ile Ser Gly Pro Phe Phe Phe Glu Asp Leu Asp Asp
 610 615 620
 Thr Ala Tyr Asp Arg Tyr Asp Trp Leu Gly Ser Asn Gln Lys Ile Asp
 625 630 635 640
 Val Leu Lys Leu Gln Leu Gly Thr Gln Pro Ser Ala Asn Ala Pro Ser
 645 650 655
 Asp Leu Thr Leu Gly Asn Glu Met Pro Lys Tyr Gly Tyr Gln Gly Ser

660					665					670					
Trp	Lys	Leu	Ala	Trp	Asp	Pro	Asn	Thr	Ala	Asn	Asn	Gly	Pro	Tyr	Thr
		675					680					685			
Leu	Lys	Ala	Thr	Trp	Thr	Lys	Thr	Gly	Tyr	Asn	Pro	Gly	Pro	Glu	Arg
	690					695					700				
Val	Ala	Ser	Leu	Val	Pro	Asn	Ser	Leu	Trp	Gly	Ser	Ile	Leu	Asp	Ile
705					710					715					720
Arg	Ser	Ala	His	Ser	Ala	Ile	Gln	Ala	Ser	Val	Asp	Gly	Arg	Ser	Tyr
				725					730					735	
Cys	Arg	Gly	Leu	Trp	Val	Ser	Gly	Val	Ser	Asn	Phe	Ser	Tyr	His	Asp
			740					745					750		
Arg	Asp	Ala	Leu	Gly	Gln	Gly	Tyr	Arg	Tyr	Ile	Ser	Gly	Gly	Tyr	Ser
		755					760					765			
Leu	Gly	Ala	Asn	Ser	Tyr	Phe	Gly	Ser	Ser	Met	Phe	Gly	Leu	Ala	Phe
	770					775					780				
Thr	Glu	Val	Phe	Gly	Arg	Ser	Lys	Asp	Tyr	Val	Val	Cys	Arg	Ser	Asn
785					790					795					800
His	His	Ala	Cys	Ile	Gly	Ser	Val	Tyr	Leu	Ser	Thr	Lys	Gln	Ala	Leu
				805					810					815	
Cys	Gly	Ser	Tyr	Leu	Phe	Gly	Asp	Ala	Phe	Ile	Arg	Ala	Ser	Tyr	Gly
			820					825					830		
Phe	Gly	Asn	Gln	His	Met	Lys	Thr	Ser	Tyr	Thr	Phe	Ala	Glu	Glu	Ser
		835					840					845			
Asp	Val	Arg	Trp	Asp	Asn	Asn	Cys	Leu	Val	Gly	Glu	Ile	Gly	Val	Gly
		850				855					860				
Leu	Pro	Ile	Val	Thr	Thr	Pro	Ser	Lys	Leu	Tyr	Leu	Asn	Glu	Leu	Arg
865					870					875					880
Pro	Phe	Val	Gln	Ala	Glu	Phe	Ser	Tyr	Ala	Asp	His	Glu	Ser	Phe	Thr
				885					890					895	
Glu	Glu	Gly	Asp	Gln	Ala	Arg	Ala	Phe	Arg	Ser	Gly	His	Leu	Met	Asn
			900					905					910		
Leu	Ser	Val	Pro	Val	Gly	Val	Lys	Phe	Asp	Arg	Cys	Ser	Ser	Thr	His
		915					920					925			
Pro	Asn	Lys	Tyr	Ser	Phe	Met	Gly	Ala	Tyr	Ile	Cys	Asp	Ala	Tyr	Arg
		930				935					940				
Thr	Ile	Ser	Gly	Thr	Gln	Thr	Thr	Leu	Leu	Ser	His	Gln	Glu	Thr	Trp
945					950					955					960
Thr	Thr	Asp	Ala	Phe	His	Leu	Ala	Arg	His	Gly	Val	Ile	Val	Arg	Gly
				965					970					975	

Ser Met Tyr Ala Ser Leu Thr Ser Asn Ile Glu Val Tyr Gly His Gly
 980 985 990

Arg Tyr Glu Tyr Arg Asp Thr Ser Arg Gly Tyr Gly Leu Ser Ala Gly
 995 1000 1005

Ser Lys Val Arg Phe
 1010

<210> 17
 <211> 505
 <212> PRT
 <213> Chlamydia

<400> 17
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 1 5 10 15

Ser Phe Pro Tyr Thr Val Ile Gly Asp Pro Ser Gly Thr Thr Val Phe
 20 25 30

Ser Ala Gly Glu Leu Thr Leu Lys Asn Leu Asp Asn Ser Ile Ala Ala
 35 40 45

Leu Pro Leu Ser Cys Phe Gly Asn Leu Leu Gly Ser Phe Thr Val Leu
 50 55 60

Gly Arg Gly His Ser Leu Thr Phe Glu Asn Ile Arg Thr Ser Thr Asn
 65 70 75 80

Gly Ala Ala Leu Ser Asn Ser Ala Ala Asp Gly Leu Phe Thr Ile Glu
 85 90 95

Gly Phe Lys Glu Leu Ser Phe Ser Asn Cys Asn Ser Leu Leu Ala Val
 100 105 110

Leu Pro Ala Ala Thr Thr Asn Lys Gly Ser Gln Thr Pro Thr Thr Thr
 115 120 125

Ser Thr Pro Ser Asn Gly Thr Ile Tyr Ser Lys Thr Asp Leu Leu Leu
 130 135 140

Leu Asn Asn Glu Lys Phe Ser Phe Tyr Ser Asn Leu Val Ser Gly Asp
 145 150 155 160

Gly Gly Ala Ile Asp Ala Lys Ser Leu Thr Val Gln Gly Ile Ser Lys
 165 170 175

Leu Cys Val Phe Gln Glu Asn Thr Ala Gln Ala Asp Gly Gly Ala Cys
 180 185 190

Gln Val Val Thr Ser Phe Ser Ala Met Ala Asn Glu Ala Pro Ile Ala
 195 200 205

Phe Val Ala Asn Val Ala Gly Val Arg Gly Gly Gly Ile Ala Ala Val
 210 215 220

Gln Asp Gly Gln Gln Gly Val Ser Ser Ser Thr Ser Thr Glu Asp Pro
 225 230 235 240
 Val Val Ser Phe Ser Arg Asn Thr Ala Val Glu Phe Asp Gly Asn Val
 245 250 255
 Ala Arg Val Gly Gly Gly Ile Tyr Ser Tyr Gly Asn Val Ala Phe Leu
 260 265 270
 Asn Asn Gly Lys Thr Leu Phe Leu Asn Asn Val Ala Ser Pro Val Tyr
 275 280 285
 Ile Ala Ala Lys Gln Pro Thr Ser Gly Gln Ala Ser Asn Thr Ser Asn
 290 295 300
 Asn Tyr Gly Asp Gly Gly Ala Ile Phe Cys Lys Asn Gly Ala Gln Ala
 305 310 315 320
 Gly Ser Asn Asn Ser Gly Ser Val Ser Phe Asp Gly Glu Gly Val Val
 325 330 335
 Phe Phe Ser Ser Asn Val Ala Ala Gly Lys Gly Gly Ala Ile Tyr Ala
 340 345 350
 Lys Lys Leu Ser Val Ala Asn Cys Gly Pro Val Gln Phe Leu Arg Asn
 355 360 365
 Ile Ala Asn Asp Gly Gly Ala Ile Tyr Leu Gly Glu Ser Gly Glu Leu
 370 375 380
 Ser Leu Ser Ala Asp Tyr Gly Asp Ile Ile Phe Asp Gly Asn Leu Lys
 385 390 395 400
 Arg Thr Ala Lys Glu Asn Ala Ala Asp Val Asn Gly Val Thr Val Ser
 405 410 415
 Ser Gln Ala Ile Ser Met Gly Ser Gly Gly Lys Ile Thr Thr Leu Arg
 420 425 430
 Ala Lys Ala Gly His Gln Ile Leu Phe Asn Asp Pro Ile Glu Met Ala
 435 440 445
 Asn Gly Asn Asn Gln Pro Ala Gln Ser Ser Lys Leu Leu Lys Ile Asn
 450 455 460
 Asp Gly Glu Gly Tyr Thr Gly Asp Ile Val Phe Ala Asn Gly Ser Ser
 465 470 475 480
 Thr Leu Tyr Gln Asn Val Thr Ile Glu Gln Gly Arg Ile Val Leu Arg
 485 490 495
 Glu Lys Ala Lys Leu Ser Val Asp Ser
 500 505

<210> 18
 <211> 57
 <212> DNA

<213> Chlamydia

<400> 18

aagggcccaa ttacgcagag ctgcagagaa attatgggtc ctcaaggaat ttacgat 57

<210> 19

<211> 20

<212> DNA

<213> Chlamydia

<400> 19

cgctctagaa ctagtggatc 20

<210> 20

<211> 22

<212> DNA

<213> Chlamydia

<400> 20

atgggtcctc aaggaattta cg 22

<210> 21

<211> 19

<212> DNA

<213> Chlamydia

<400> 21

ggtcccccat cagcgggag 19

<210> 22

<211> 1515

<212> DNA

<213> Chlamydia

<400> 22

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aatcttgaca attctattgc agctttgcct ttaagttggt ttgggaactt attagggagt 180
tttactgttt tagggagagg aactcggtg actttcgaga acatacggac ttctacaaat 240
ggggcagctc taagtaatag cgctgctgat ggactgttta ctattgaggg ttttaaagaa 300
ttatcctttt ccaattgcaa ttcattactt gccgtactgc ctgctgcaac gactaataag 360
ggtagccaga ctccgacgac aacatctaca ccgtctaatt gtactattta ttctaaaaca 420
gatcttttgt tactcaataa tgagaagttc tcattctata gtaatttagt ctctggagat 480
gggggagcta tagatgctaa gagcttaacg gttcaaggaa ttagcaagct ttgtgtcttc 540
caagaaaata ctgctcaagc tgatggggga gcttgtcaag tagtcaccag tttctctgct 600
atggctaacg aggctcctat tgcctttgta gcgaatgttg caggagtaag agggggaggag 660
attgctgctg ttcaggatgg gcagcaggga gtgtcatcat ctacttcaac agaagatcca 720
gtagtaagtt tttccagaaa tactgcggta gagtttgatg ggaacgtagc ccgagtagga 780
ggagggattt actcctacgg gaacgttgct ttcctgaata atggaaaaac cttgtttctc 840
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aatacgagta ataattacgg agatggagga gctatcttct gtaagaatgg tgcgcaagca 960
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aatgtagctg ctgggaaagg gggagctatt tatgccaaaa agctctcggt tgctaactgt 1080
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tctggagagc tcagttttatc tgctgattat ggagatatta ttttcgatgg gaatcttaaa 1200
agaacagcca aagagaatgc tgccgatgtt aatggcgtaa ctgtgtcctc acaagccatt 1260
tcgatgggat cgggagggaa aataacgaca ttaagagcta aagcagggca tcagattctc 1320
tttaatgatc ccacgcagat ggcaaacgga aataaccagc cagcgcagtc ttccaaactt 1380

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ctaaaaatta acgatggtga aggatacaca ggggatattg tttttgctaa tggaagcagt 1440
actttgtacc aaaatggttac gatagagcaa ggaaggattg ttcttcgtga aaaggcaaaa 1500
ttatcagtga attct 1515

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<210> 23
<211> 3354
<212> DNA
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence:
      recombinant expression vector

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<400> 23
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ttaactgtat catttcccta tactgttata ggagatccga gtgggactac tgttttttct 180
gcaggagagt taacgttaaa aaatcttgac aattctattg cagctttgcc tttaagttgt 240
tttgggaact tattagggag ttttactggt ttagggagag gacactcgtt gactttcgag 300
aacatacgga cttctacaaa tggagctgca ctaagtgaca gcgctaatag cggggtattt 360
actattgagg gttttaaaga attatctttt tccaattgca acccattact tgccgtactg 420
cctgctgcaa cgactaataa tggtagccag actccgtcga caacatctac accgtctaata 480
ggtactatatt attctaaaac agatcttttg ttactcaata atgagaagtt ctcatcttat 540
agtaattcag tctctggaga tgggggagct atagatgcta agagcttaac ggttcaagga 600
attagcaagc tttgtgtctt ccaagaaaat actgctcaag ctgatggggg agcttgtcaa 660
gtagtaccca gtttctctgc tatggctaac gaggctccta ttgcctttgt agcgaatggt 720
gcaggagtaa gagggggagg gattgctgct gttcaggatg ggcagcaggg agtgtcatca 780
tctacttcaa cagaagatcc agtagtaagt ttttccagaa atactgcggg agagtttgat 840
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aatggaaaaa ccttgtttct caacaatggt gcttctcctg tttacattgc tgctgagcaa 960
ccaacaaatg gacaggcttc taatacagag gataattac gagatggagg agctatcttc 1020
tgttaagaatg gtgcgcaagc agcaggatcc aataactctg gatcagtttc ctttgatgga 1080
gagggagtag ttttctttag tagcaatgta gctgctggga aagggggagc tatttatgcc 1140
aaaaagctct cggttgctaa ctgtggccct gtacaactct tagggaatat cgctaatagat 1200
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gcagagaacg	gctcaattat	ctcagcta	ggcgacaatt	taacgattac	cggacaaaac	3300
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<210> 24

<211> 3324

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
recombinant expression vector

<400> 24

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gagaacatac	ggactttctac	aaatggagct	gcactaagtg	acagcgctaa	tagcgggtta	360
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<210> 25
 <211> 65
 <212> PRT
 <213> Chlamydia

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Gly Glu Leu Thr Leu Lys Asn Leu Asp Asn Ser Ile Ala Ala Pro Leu
             20             25             30
Ser Cys Phe Gly Asn Leu Leu Gly Ser Phe Thr Val Leu Gly Arg Gly
             35             40             45
His Ser Leu Thr Phe Glu Asn Ile Arg Thr Ser Thr Asn Gly Ala Ala
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Leu
65

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<210> 26
 <211> 24
 <212> PRT
 <213> Chlamydia

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<400> 26
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Ser Leu Leu Ala Asn Asn Ala Val
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<210> 27

<211> 8
<212> PRT
<213> Chlamydia

<400> 27
Gly Tyr Thr Gly Asp Ile Val Phe
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<210> 28
<211> 7
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<213> Chlamydia

<400> 28
Tyr Gly Asp Ile Ile Phe Asp
1 5

<210> 29
<211> 63
<212> PRT
<213> Chlamydera cerviniventris

<400> 29
Gly Tyr Ala Ala Glu Ile Met Val Pro Gln Gly Ile Tyr Asp Gly Glu
1 5 10 15
Thr Leu Thr Val Ser Phe Pro Tyr Thr Val Ile Gly Asp Pro Ser Gly
20 25 30
Thr Thr Val Phe Ser Ala Gly Glu Leu Thr Leu Lys Asn Leu Asp Asn
35 40 45
Ser Ile Ala Ala Leu Pro Leu Ser Cys Phe Gly Asn Leu Leu Gly
50 55 60

<210> 30
<211> 22
<212> PRT
<213> Chlamydia

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Ile Asn Asp Gly Glu Gly
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<210> 31
<211> 14
<212> PRT
<213> Chlamydia

<400> 31
Ala Asn Gly Ser Ser Thr Leu Tyr Gln Asn Val Thr Ile Glu

1 5 10

<210> 32
 <211> 10
 <212> PRT
 <213> Chlamydia

<400> 32
 Lys Leu Ser Val Asn Ser Leu Ser Gln Thr
 1 5 10

<210> 33
 <211> 45
 <212> PRT
 <213> Chlamydia

<400> 33
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 1 5 10 15
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 Gly Ser Asn Gln Lys Ile Asn Val Leu Lys Leu Gln Leu
 35 40 45

<210> 34
 <211> 64
 <212> PRT
 <213> Chlamydia

<400> 34
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 1 5 10 15
 Phe Phe Glu Asp Leu Asp Asp Thr Ala Tyr Asp Arg Tyr Asp Trp Leu
 20 25 30
 Gly Ser Asn Gln Lys Ile Asn Val Leu Lys Leu Gln Leu Gly Thr Lys
 35 40 45
 Pro Pro Ala Asn Ala Pro Ser Asp Leu Thr Leu Gly Asn Glu Met Pro
 50 55 60

<210> 35
 <211> 10
 <212> PRT
 <213> Chlamydia

<400> 35
 Asp Pro Asn Thr Ala Asn Asn Gly Pro Tyr

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<210> 36
 <211> 458
 <212> PRT
 <213> Chlamydia

<400> 36

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 20 25 30
 Ile Ala Ala Val Gln Asp Gly Gln Gln Gly Val Ser Ser Ser Thr Ser
 35 40 45
 Thr Glu Asp Pro Val Val Ser Phe Ser Arg Asn Thr Ala Val Glu Phe
 50 55 60
 Asp Gly Asn Val Ala Arg Val Gly Gly Gly Ile Tyr Ser Tyr Gly Asn
 65 70 75 80
 Val Ala Phe Leu Asn Asn Gly Lys Thr Leu Phe Leu Asn Asn Val Ala
 85 90 95
 Ser Pro Val Tyr Ile Ala Ala Lys Gln Pro Thr Ser Gly Gln Ala Ser
 100 105 110
 Asn Thr Ser Asn Asn Tyr Gly Asp Gly Gly Ala Ile Phe Cys Lys Asn
 115 120 125
 Gly Ala Gln Ala Gly Ser Asn Asn Ser Gly Ser Val Ser Phe Asp Gly
 130 135 140
 Glu Gly Val Val Phe Phe Ser Ser Asn Val Ala Ala Gly Lys Gly Gly
 145 150 155 160
 Ala Ile Tyr Ala Lys Lys Leu Ser Val Ala Asn Cys Gly Pro Val Gln
 165 170 175
 Phe Leu Arg Asn Ile Ala Asn Asp Gly Gly Ala Ile Tyr Leu Gly Glu
 180 185 190
 Ser Gly Glu Leu Ser Leu Ser Ala Asp Tyr Gly Asp Ile Ile Phe Asp
 195 200 205
 Gly Asn Leu Lys Arg Thr Ala Lys Glu Asn Ala Ala Asp Val Asn Gly
 210 215 220
 Val Thr Val Ser Ser Gln Ala Ile Ser Met Gly Ser Gly Gly Lys Ile
 225 230 235 240
 Thr Thr Leu Arg Ala Lys Ala Gly His Gln Ile Leu Phe Asn Asp Pro
 245 250 255
 Ile Glu Met Ala Asn Gly Asn Asn Gln Pro Ala Gln Ser Ser Lys Leu

260					265					270					
Leu	Lys	Ile	Asn	Asp	Gly	Glu	Gly	Tyr	Thr	Gly	Asp	Ile	Val	Phe	Ala
		275					280					285			
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Ile	Val	Leu	Arg	Glu	Lys	Ala	Lys	Leu	Ser	Val	Asn	Ser	Leu	Ser	Gln
305					310					315					320
Thr	Gly	Gly	Ser	Leu	Tyr	Met	Glu	Ala	Gly	Ser	Thr	Trp	Asp	Phe	Val
				325					330					335	
Thr	Pro	Gln	Pro	Pro	Gln	Gln	Pro	Pro	Ala	Ala	Asn	Gln	Leu	Ile	Thr
			340					345					350		
Leu	Ser	Asn	Leu	His	Leu	Ser	Leu	Ser	Ser	Leu	Leu	Ala	Asn	Asn	Ala
		355					360					365			
Val	Thr	Asn	Pro	Pro	Thr	Asn	Pro	Pro	Ala	Gln	Asp	Ser	His	Pro	Ala
	370					375					380				
Val	Ile	Gly	Ser	Thr	Thr	Ala	Gly	Ser	Val	Thr	Ile	Ser	Gly	Pro	Ile
385					390					395					400
Phe	Phe	Glu	Asp	Leu	Asp	Asp	Thr	Ala	Tyr	Asp	Arg	Tyr	Asp	Trp	Leu
				405					410					415	
Gly	Ser	Asn	Gln	Lys	Ile	Asn	Val	Leu	Lys	Leu	Gln	Leu	Gly	Thr	Lys
			420					425					430		
Pro	Pro	Ala	Asn	Ala	Pro	Ser	Asp	Leu	Thr	Leu	Gly	Asn	Glu	Met	Pro
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Lys	Tyr	Gly	Tyr	Gln	Gly	Ser	Trp	Lys	Leu						
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<210> 37
 <211> 325
 <212> PRT
 <213> Chlamydia

<400> 37
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 20 25 30
 Arg Ser Ala His Ser Ala Ile Gln Ala Ser Val Asp Gly Arg Ser Tyr
 35 40 45
 Cys Arg Gly Leu Trp Val Ser Gly Val Ser Asn Phe Phe Tyr His Asp
 50 55 60
 Arg Asp Ala Leu Gly Gln Gly Tyr Arg Tyr Ile Ser Gly Gly Tyr Ser

65		70		75		80									
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			85						90					95	
Thr	Glu	Val	Phe	Gly	Arg	Ser	Lys	Asp	Tyr	Val	Val	Cys	Arg	Ser	Asn
		100						105					110		
His	His	Ala	Cys	Ile	Gly	Ser	Val	Tyr	Leu	Ser	Thr	Gln	Gln	Ala	Leu
		115					120					125			
Cys	Gly	Ser	Tyr	Leu	Phe	Gly	Asp	Ala	Phe	Ile	Arg	Ala	Ser	Tyr	Gly
	130					135					140				
Phe	Gly	Asn	Gln	His	Met	Lys	Thr	Ser	Tyr	Thr	Phe	Ala	Glu	Glu	Ser
145					150					155					160
Asp	Val	Arg	Trp	Asp	Asn	Asn	Cys	Leu	Ala	Gly	Glu	Ile	Gly	Ala	Gly
			165						170					175	
Leu	Pro	Ile	Val	Ile	Thr	Pro	Ser	Lys	Leu	Tyr	Leu	Asn	Glu	Leu	Arg
		180						185					190		
Pro	Phe	Val	Gln	Ala	Glu	Phe	Ser	Tyr	Ala	Asp	His	Glu	Ser	Phe	Thr
		195					200					205			
Glu	Glu	Gly	Asp	Gln	Ala	Arg	Ala	Phe	Lys	Ser	Gly	His	Leu	Leu	Asn
	210					215					220				
Leu	Ser	Val	Pro	Val	Gly	Val	Lys	Phe	Asp	Arg	Cys	Ser	Ser	Thr	His
225					230					235					240
Pro	Asn	Lys	Tyr	Ser	Phe	Met	Ala	Ala	Tyr	Ile	Cys	Asp	Ala	Tyr	Arg
			245						250					255	
Thr	Ile	Ser	Gly	Thr	Glu	Thr	Thr	Leu	Leu	Ser	His	Gln	Glu	Thr	Trp
		260						265					270		
Thr	Thr	Asp	Ala	Phe	His	Leu	Ala	Arg	His	Gly	Val	Val	Val	Arg	Gly
		275					280					285			
Ser	Met	Tyr	Ala	Ser	Leu	Thr	Ser	Asn	Ile	Glu	Val	Tyr	Gly	His	Gly
	290					295					300				
Arg	Tyr	Glu	Tyr	Arg	Asp	Ala	Ser	Arg	Gly	Tyr	Gly	Leu	Ser	Ala	Gly
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Ser	Arg	Val	Arg	Phe											
				325											

<210> 38

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 38
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<210> 39
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 39
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<210> 40
<211> 55
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 40
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<210> 41
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 41
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ctacttctg cactcaaacc 80
